



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/717,036	11/22/2000	Roberta Castagnetti	10676-0058-25	2446

26541 7590 03/02/2004

RITTER, LANG & KAPLAN
12930 SARATOGA AE. SUITE D1
SARATOGA, CA 95070

EXAMINER

TRAN, DZUNG D

ART UNIT	PAPER NUMBER
----------	--------------

2633

DATE MAILED: 03/02/2004

6

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/717,036

Applicant(s)

CASTAGNETTI ET AL.

Examiner

Dzung D Tran

Art Unit

2633

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11/22/2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-60 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-60 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 5-15, 17, 21-27, 29, 43, 45, 49-55 and 57-60 are rejected under 35 U.S.C. 102(e) as being anticipated by Sugaya et al. US 6,292,289.

Regarding claims 1, 15, 43, Sugaya discloses a WDM (wavelength division multiplexing) optical communication system (figure 4) for providing automatic gain and tilt control comprising: an optical fiber 6 that carries a plurality of optical signals, at least one of the optical signals being a reference signal λ_{osc} (col. 7, lines 39-58);

an optical gain unit 234, 244, 238, 250 coupled to the optical fiber and configured to output lights to compensate, in part, for losses associated with the optical fiber and gain tilt accumulation (col. 18, line 15 to col. 19, line 19);

an optical supervisory circuit 20 (same as controller) configured to control the optical gain unit, the controller detecting and analyzing the reference signal to determine, in part, power variation of the reference signal, wherein the controller outputs

a control signal to the optical gain unit based upon the analyzed reference signal (col. 8, line 62 to col. 9, line 43); and

an optical amplifier 16 coupled to the optical fiber and configured to amplify the optical signals, the optical gain unit providing a constant power per channel at an input of the optical amplifier (col. 8, lines 4-18, col. 18, lines 15-65).

Regarding claims 5, 21 and 49, Sugaya further discloses the gain unit is a variable optical attenuator 216 (col. 18, lines 66-67).

Regarding claims 6, 13, 14, 22, 50, 59, 60, Sugaya further discloses one supervisory optical signal (same as reference signal) is set in the C band and the other is set in the L band (col. 9, lines 44-49, col. 17, lines 59-65).

Regarding claims 7, 23 and 51, Sugaya further discloses photodiodes 234, 244, 238, 250 for converting the optical signal to a corresponding electrical signal (col. 19, lines 35-39).

Regarding claims 8-11, 24-27 and 52-55, Sugaya further discloses the optical supervisory circuit 20 (same as controller) processes (i.e. detect, calculate and determine) the supervisory optical signal (reference signal) so that undue degradation of noise characteristic and gain efficiency in the optical repeater can be prevented to ensure a good transmission characteristic of the main signal (col. 9, lines 20-49).

Regarding claims 12 and 57, Sugaya further discloses for extracting and regenerating the reference signal (figure 4, col. 8, line 43 to col. 9, line 20).

Regarding claims 17, 45, Sugaya further discloses the pump light may propagate in the same direction in the EDF, thereby performing forward pumping and the pump

Art Unit: 2633

light may propagate in the opposite direction in the EDF, thereby performing backward pumping (col. 9, lines 62-67).

Regarding claim 29, Sugaya further discloses for extracting and regenerating the reference signal (figure 4, col. 8, line 43 to col. 9, line 20).

Regarding claim 58, Sugaya further discloses the optical amplifier is an Erbium Doped Fiber Amplifier (col. 9, lines 50, 52- 66).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2-4, 16, 18-20, 28, 30-42, 44, 46-48 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugaya et al. US 6,292,289 in view of Tanaka et al. US patent no. 6,683,712.

Regarding claims 2, 3, 16, 34 and 44, Sugaya further disclose the pump light may propagate in the same direction in the EDF, thereby performing forward pumping and the pump light may propagate in the opposite direction in the EDF, thereby performing backward pumping. Sugaya differs from claims 2, 3, 16 and 17, 34, 44, 45 of the present invention in that he does not specific disclose the optical gain unit is a Raman pump unit. Tanaka, from the field of endeavor, discloses the Raman amplifier

including the Raman pumps 11 (abstract, figure 1). At the time of the invention was made, it would have been obvious to a person of ordinary skill in the art to incorporate the Raman pump of Tanaka in the system of Sugaya. One of ordinary skill in the art would have been motivated to do this in order to provide power or gain to different wavelengths in the WDM system and since Raman scattering can occur at any wavelength, this can be exploited to advantage in a telecommunication system that contains multiple signal wavelengths by using Raman pumps at several different wavelengths to amplify the signals. The gain seen by a given wavelength is the superposition of the gain provided by all the pumps, taking into account the transfer of energy between the pumps due to Raman scattering.

Regarding claim 33, Sugaya further discloses a variable optical attenuator 216 (col. 18, lines 66-67).

Regarding claims 4, 20 and 48, Tanaka discloses the Raman amplifier includes a plurality of laser diodes that are controlled to output a plurality of output lights, the output lights being multiplexed (figure 6, elements 11₁ ... 11_i, 16).

Regarding claims 31, 32, 35, 41 and 42, Sugaya further discloses one supervisory optical signal (same as reference signal) is set in the C band and the other is set in the L band (col. 9, lines 44-49, col. 17, lines 59-65).

Regarding claims 36-39, Sugaya further discloses the optical supervisory circuit 20 (same as controller) processes (i.e. detect, calculate and determine) the supervisory optical signal (reference signal) so that undue degradation of noise characteristic and

Art Unit: 2633

gain efficiency in the optical repeater can be prevented to ensure a good transmission characteristic of the main signal (col. 9, lines 20-49).

Regarding claims 28, 40 and 56, Sugaya further discloses for extracting and regenerating the reference signal (figure 4, col. 8, line 43 to col. 9, line 20).

Regarding claims 18, 19, 46 and 47, Tanaka further discloses the Raman pump is co-located with the controller (figure 14, element 16(#1)). Furthermore, whether the pump is located remotely from controller or co-located with the controller is merely an engineering design choice.

Regarding claim 30, Sugaya further discloses the optical amplifier is an Erbium Doped Fiber Amplifier (col. 9, lines 50, 52- 66).

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


- a. Bode et al. U.S. patent no. 6,212,001. Method and system for controlling optical amplification in WDM optical transmission
- b. Bonnedal et al. U.S. patent no. 6,522,460. Optical fiber amplifier control
- c. Ford et al. U.S. patent no. 6,392,769. Automatic level control circuit for optical system
- d. Friedrich US patent no. 6,452,715. Method and apparatus for determining a fiber plan gain transfer function

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dzung Tran whose telephone number is (703) 305-0932.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's Supervisor, Jason Chan, can be reached on (703) 305-4729.

The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.


JASON CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600